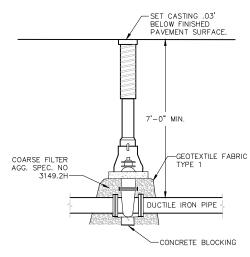
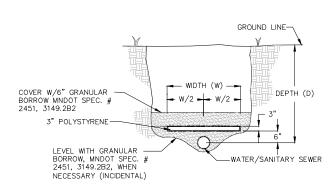
SANITARY CASTING DETAIL



USE EPOXY COATING ON EXTERIOR OF VALVES ALL BOLTS SHALL BE COR-TEN WITH ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS. ANODE SIZE - REGULAR.

WATER VALVE BOX - DUCTILE IRON MAIN

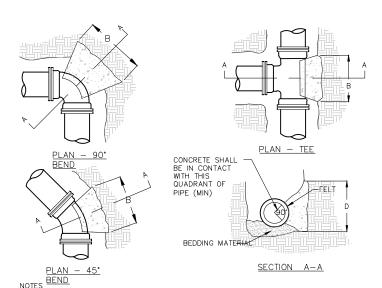


1. LAYERING OF 2 OR 3 SHEETS TO ARRIVE AT 3" IS PERMITTED WITH JOINTS OFFSET A MINIMUM OF 6'

POLYSTYRENE SHALL BE AS SPECIFIED IN THE CITY OF DULUTH PUBLIC WORKS AND LITHLITIES STANDARD CONSTRUCTION SPECIFICATIONS.

DEPTH (D)	WIDTH (W)
7' OR MORE	NONE
5.2' TO 6.9'	4'-0"
4.3' TO 5.1'	6'-0"
3.0' TO 4.2'	8'-0"
,	

WATER/SANITARY SEWER INSULATION DETAIL



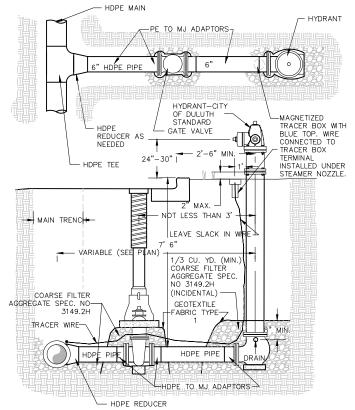
- NOTES BEIND

 1. DIMENSIONS IN TABLE ARE BASED ON A WATER PRESSURE OF 150 P.S.I. & AN EARTH
- RESISTANCE OF 2 TONS/S.F. BLOCKING TO BE SET AGAINST UNDISTURBED SOIL
- 3. CONCRETE SHALL BE TYPE 3 GRADE B. (MNDOT SPEC. 2461) CONCRETE SHALL NOT
- INTERFERE WITH MECHANICAL JOINTS

 4. POLYETHLYENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.

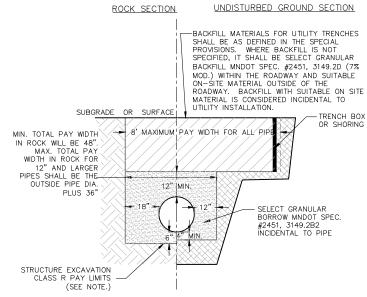
BLOCKING DIMENSIONS									
BEND OR BRANCH SIZE	22-1/2" BENDS		45° BENDS		90° BENDS		TEES		
	В	D	В	D	В	D	В	D	
6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-4"	1'-2"	1'-3"	1'-0"	
8"	1'-0"	1'-0"	1'-4"	1'-2"	1'-10"	1'-6"	1'-6"	1'-4"	
12"	1'-4"	1'-4"	1'-10"	1'-10"	2'-8"	2'-3"	2'-3"	2'-0"	
16"	1'-10"	1'-8"	2'-6"	2'-4"	3'-10"	2'-10"	3'-2"	2'-4"	
20"	2'-4"	2'-0"	3'-3"	2'-10"	5'-0"	3'-4"	4'-0"	3'-0"	
24"	2'-10"	2'-4"	4'-0"	3'-3"	6'-4"	3'-10"	5'-3"	3'-4"	
26"	3'-6"	3'-0"	5'-4"	3'-10"	8'-0"	4'-8"	6'-3"	4'-3"	

THRUST BLOCKING FOR WATERMAIN



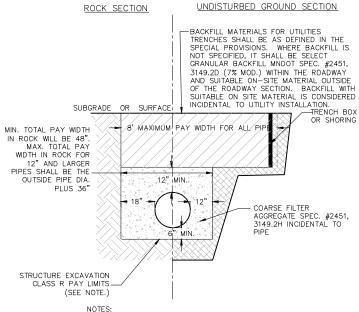
- NOTES
 1. VALVES SHALL BE CONNECTED DIRECTLY TO MECHANICAL JOINT ADAPTORS.
- 2. USE EPOXY COATING ON VALVE AND HYDRANT BASE
 3. ALL BOLTS SHALL BE COR—TEN WITH ZINC ANODE CAPS CONFORMING TO ASTM B—418
 FOR ALL MECHANICAL JOINT FITTINGS. ANODE SIZE REGULAR.

FIRE HYDRANT SETTING DETAIL - HDPE



- 1. TRENCH STABILIZATION MATERIAL MAY BE USED IN AREAS AS DETERMINED BY THE ENGINEER.
 2. A MIN. OF 1 CU. YD. OF STRUCTURE EXCAVATION,
- CLASS R, WILL BE PAID FOR EVERY 10' OF PIPE WHERE ROCK REMOVAL IS REQUIRED. 3. EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED
- 3. EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED OF OFF PROJECT R.O.W. (INCIDENTAL)
 4. WHERE UTILITIES ARE INSTALLED IN ROCK TRENCHES OUTSIDE OF THE ROADWAY, THE CONTRACTOR SHALL PROVIDE COMMON BORROW MATERIAL TO SUPPLEMENT SUITABLE ON SITE BACKFILL MATERIALS AS NECESSARY. COMMON BORROW MATERIAL IS INCIDENTAL TO STRUCTURE EXCAVATION, CLASS R. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON COMMON BORROW MATERIALS.

DUCTILE IRON, PE WATERMAIN, PRESSURE SEWER, & FORCEMAIN BEDDING



- NUIES:

 1. TRENCH STABILIZATION MATERIAL MAY BE USED IN AREAS AS DETERMINED BY THE ENGINEER.

 2. A MIN. OF 1 CU. YD. OF STRUCTURE EXCAVATION, CLASS R, WILL BE PAID FOR EVERY 10' OF PIPE
 WHERE ROCK REMOVAL IS REQUIRED.

 3. EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED
- EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED OF OFF PROJECT R.O.W. (INCIDENTAL)

 WHERE UTILITIES ARE INSTALLED IN ROCK TRENCHES OUTSIDE OF THE ROADWAY, THE CONTRACTOR SHALL PROVIDE COMMON BORROW MATERIAL TO SUPPLEMENT SUITABLE ON SITE BACKFILL MATERIALS AS NECESSARY. COMMON BORROW MATERIAL IS INCIDENTAL TO STRUCTURE EXCAVATION, CLASS R. REFER TO SPECIFICATIONS FOR RESTRICTIONS ON COMMON BORROW MATERIALS.

PVC AND CORRUGATED POLYETHYLENE **SEWER PIPE BEDDING DETAIL**



Reynolds, Smith and Hills, Inc 4525 Airport Approach Road, Ste A Duluth, Minnesota 55811 218-722-1227 FAX 218-722-1052 www.rsandh.com





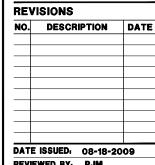
227 WEST FIRST STREET SLITTE 200

NORTH **BUSINESS DEVELOPMENT AREA**

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Typed Name SCOTT T. STEMPIHAR

Date 08/18/09 Reg. No. 47565



REVIEWED BY: PJM

DRAWN BY: SCA DESIGNED BY: STS

AEP PROJECT NUMBER

214-1882-093

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SHEET TITLE UTILITY

DETAILS AND **NOTES**

SHEET NUMBER

C601

BID **DOCUMENTS**